#76047

Cruise Report

R/V OCEANUS 17

Dec. 3-10, 1976

Roscop
31 Jan 77
JR

B. Butman
USGS

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Ship: OCEANUS

Cruise No. 17

Area of Operation: Mid Atlantic Bight
Georges Bank

Dates: Depart Woods Hole 1600 3 Dec. 1976
Return Woods Hole 0800 10 Dec. 1976

Personnel:

Michael Palmeiri	Master	
B. Butman	Chief Scientist, USGS	(Oceanographer)
W. Strahle	USGS	(E. Engineer)
R. Fabro	USGS	(GFA)
G. Prisby	USGS	(GFA)
B. Jaworski	USGS	(GFA)
J. Mclean	USGS	(GFA)
J. Milliman	WHOI	(Associate Scientist)
J. Vermersch	WHOI	(Research Associate)
L. Toner	WHOI	(Research Associate)
C. Parmenter	WHOI	(Research Associate)
B. Beauchamp	BLM	
D. Stremaitis	ERCO	

12 scientific party
8 days at sea
96 man days at sea

Objectives:

The objectives of Oceanus 17 were to:

1. Recover and deploy several bottom tripod systems which monitor sediment transport

2. Make underway XBT observations of water temperature structure, particularly to determine the position of shelf-slope water front with respect to tripod and current meter locations.

3. Obtain water samples of selected stations for suspended sediment analysis.

4. Replace and deploy as necessary surface marker floats at tripod locations.

Narrative:

Dec. 3	1600	Depart Woods Hole
	2000	Start XBT Section
Dec. 4	0800	Arrive Station A, Georges Bank
	1030	Recover USGS Current Mooring 115
	1400	Recover USGS Tripod Mooring 116
		(Tripod approximately 4 nm SW of surface buoy locations. Position determined by ranging. Both releases required for recovery.)
	1500-2200	Recover and reset two surface marker buoys with new chain. Crane broken (1600-1800)
	2330	Deploy USGS Current Mooring 118
Dec. 5	0900	Deploy USGS Tripod Mooring 120
	1100	Underway to Mid Atlantic site tripod Cruise track along 80m isobath XBT and suspended sediment sampling
Dec. 6		XBT's and suspended sediment sampling
Dec. 7	0200	Arrived at Station C, seas too rough to recover surface marker, rig new marker
	0900	Deploy surface marker, too rough to deploy tripod XBT section across shelf looking for storm induced shoreward bottom flow, seas 10-15', wind 30-50 mph

Dec. 8	1000	Deploy USGS Tripod Mooring 119 Hydraulics parted on crane - hydraulic oil all over deck XBT's underway to Station A Snow, heavy NW winds, seek shelter under N.J. lee shore
Dec. 9	0700	Start run from lee shore to Station A
	1100	On Station A heavy seas and winds, await calmer weather
	1600	Recover USGS Tripod Mooring 117 - good condition. Recover through A-frame since crane broke
	1800	Underway to Woods Hole. XBT and suspended sediment sampling
Dec. 10	0900	Arrive Woods Hole Unload
	1500	Unloading completed

Tabulated Information:

a. Number of days at sea — 8

b. Total ship track — approximately 900 mi

c. Number of stations

XBT profiles	83
Transmissometer profiles	22
Water samples (salinity)	95
Water samples, suspended matter	65

d. Instrumentation recovered

(1) Mooring 115 (current meter mooring)
(Site A, Georges Bank 40 51.2, 67 20.7)
2 current meters
1 current meter lost

(2) Mooring 116 (tripod)
Site A, Georges Bank
(instrument dragged 4 mi., some damage to frame, connectors partially unplugged)

(3) Mooring 117 (tripod)
(Site A, Mid Atlantic 39 26.0, 72 59.3)

e. Instrumentation deployed

(1) Mooring 118 (current meter mooring)
(Site A, Georges Bank 40 51.2, 67 24.7)

(2) Mooring 119 (tripod mooring)
(Site C, Mid Atlantic 38 32.5, 73 30.5)

(3) Mooring 120 (tripod mooring)
(Site A, Georges Bank 40 51.2, 67 24.7)

Instrumentation Condition

Tripod Mooring 116, Current Mooring 115

The tripod deployed on the southern flank of Georges Bank was recovered approximately four miles to the WSW of the deployed position. Apparently the instrument had been dragged by a fishing boat. The tripod had been set between four surface markers to protect against fishing activity; the relative position of the surface markers had changed and one surface marker was missing. Unfortunately, the marker supported a VACM current meter (part of Mooring 115). This is the first surface marker lost in the program.

Tripod 116 was in relatively good shape given that the package had been dragged four miles. One leg was bent. The release pinger was severely corroded, and all camera anodes were depleted. The end cap of the SEA DATA recording package was severely worn, apparently where it had been dragged along the bottom. Clam shells were stuck around the tie rods. The camera connector was completely unplugged from the SEA DATA end cap. One other penetrator was partially unplugged. Two struts of the current meter cage were broken, and the rotor was off its pivots.

Subsequent analysis of the data indicates that the tripod was dragged on November 5, approximately 6 days after the instrument was deployed. Good pressure, temperature, transmissometer and rare records were obtained for the entire deployment. Current speed failed at the time of dragging due to

mechanical breakage of the sensor cage. The camera record is good prior to dragging; all film capacity was exhausted during the tripod (one picture obtained every 8-10 seconds for two hours). Possibly the trigger mechanism is sensitive to vibration.

Tripod Mooring 117

The tripod deployed at Site A in the Middle Atlantic was in good condition. The transmissometer prism backing had pulled away.

Subsequent analysis of the data indicate good temperature, pressure, current, and camera records. The transmissometer record is good for approximately two weeks. After two weeks the prism starts to deteriorate and the signal gradually goes to zero.

Preliminary Data Analysis

Tripod Data

Very preliminary analysis of the tripod data from both Mid Atlantic and Georges Bank sites indicate:

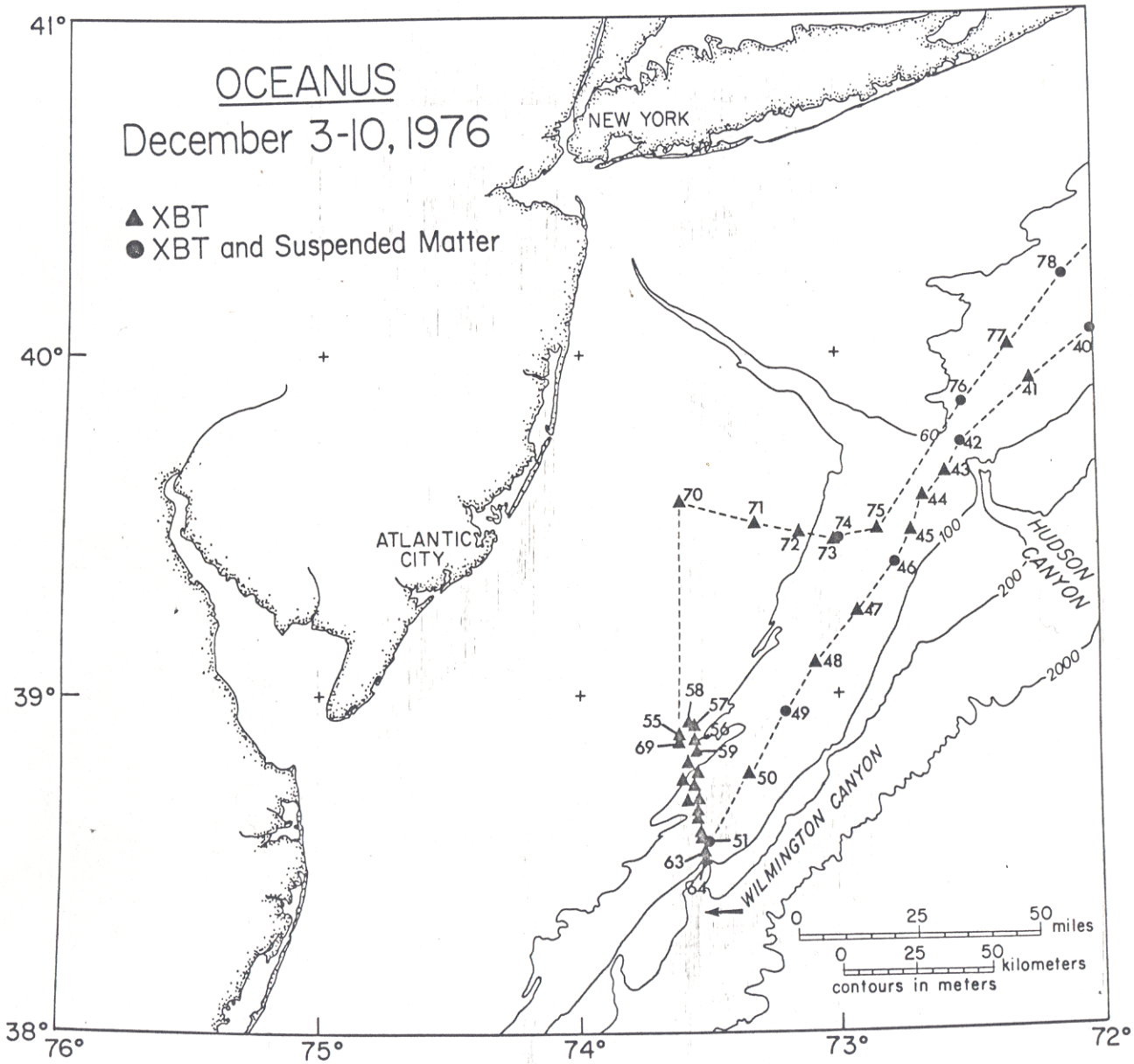
1) Resuspension of bottom material caused by wave activity and "mean" currents.
2) Large changes in suspended concentration correlated with temperature changes are due to the movement of the shelf-slope water interface past the tripod sensor. The slope water is relatively clear (and warm), while the shelf water is relatively turbid (and cold), at least in early winter. Transmissometer transects obtained on OCEANUS 17, and OCEANUS 13 support this hypothesis. The large turbidity changes correlated with temperature indicate the importance of cross-shelf temperature sections (XBT's) to determine the position of the shelf-slope front. These should be made, at a minimum, at

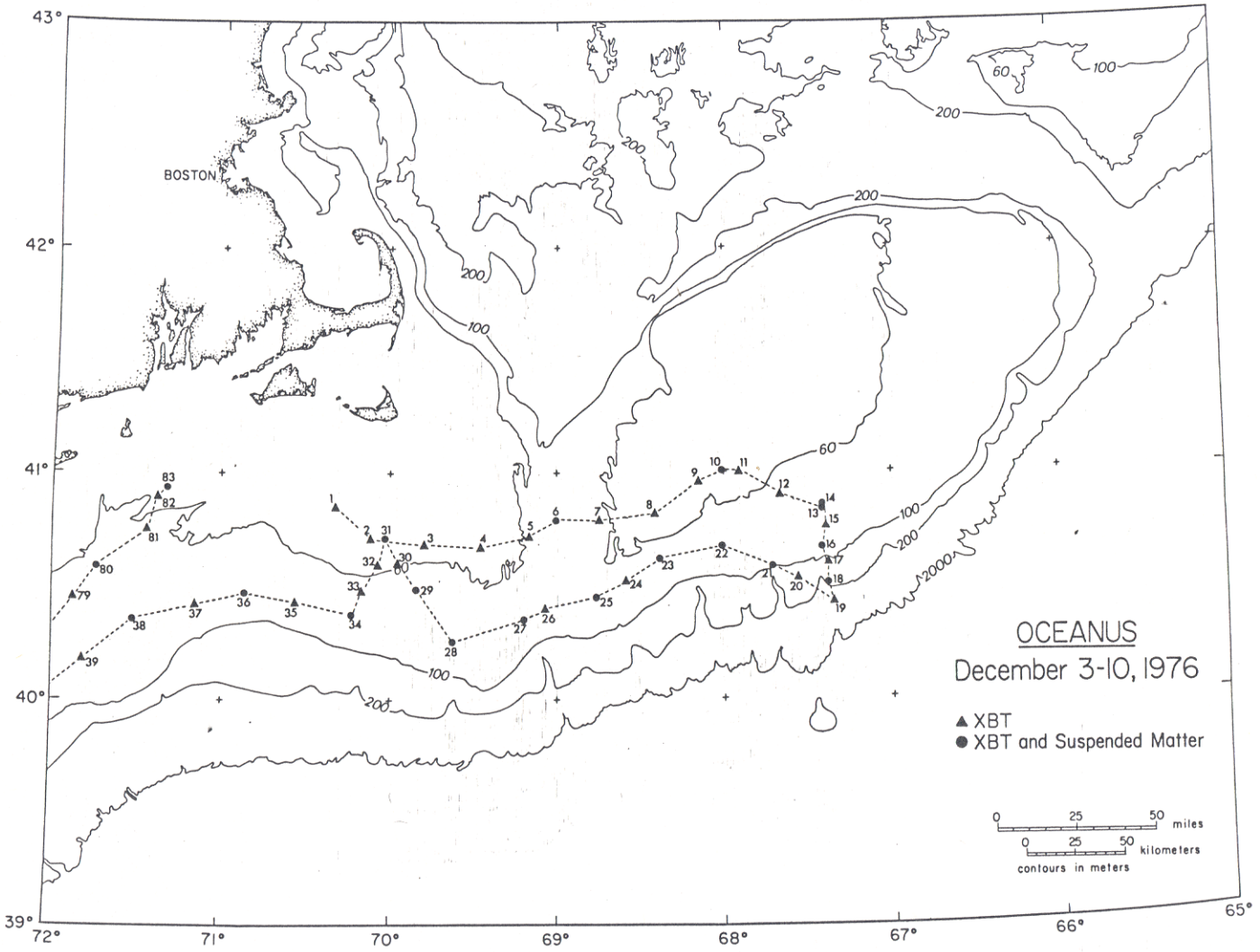
recovery and deployment of the instruments to assist in interpretation of the data records.

Suspended Sediment Data

Preliminary analysis of the transmissometer profiles indicate that the shelf water is relatively turbid compared to the slope water. A small decrease in transmission was observed near bottom, particularly over the fine "mud" region south of Nantucket and Martha's Vineyard.

APPENDICES


OCEANUS
December 3-10, 1976
▲ XBT
● XBT and Suspended Matter
NEW YORK
ATLANTIC CITY
HUDSON CANYON
WILMINGTON CANYON
100
200
2000
0 25 50 miles
0 25 50 kilometers
contours in meters
41°
40°
39°
38°
76°
75°
74°
73°
72°



SCALE

0 25 50 miles

0 25 50 kilometers

contours in meters

STATION LOCATIONS OCEANUS 17

Sta.	Date	Time	Latitude	Longitude	XBT	Surf	NT	Suspended Sample Depth (m)			Water Depth (m)
1	12/3	2000	40°52.2'N	70°20.5'W	✓	✓					43
2		2100	40°43.5'N	70°07.0'W	✓	✓					42
3		2200	40°41.0'N	69°48.0'W	✓	✓					52
4		2300	40°40.4'N	69°28.5'W	✓	✓					50
5	12/4	0000	40°43.1'N	69°11.5'W	✓	✓					67
6		0115	40°48.1'N	68°59.7'W	✓	✓	✓	1.6	30	72	74
7		0310	40°48.8'N	68°45.4'W	✓	✓					62
8		0410	40°49.4'N	68°25.8'W	✓	✓					42
9		0515	40°57.7'N	68°10.0'W	✓	✓					42
10		0610	41°01.2'N	68°01.8'W	✓	✓	✓	1.6	20	44	45
11		0710	40°59.8'N	67°54.9'W	✓	✓					58
12		0750	40°54.5'N	67°40.3'W	✓	✓					65
13		0900	40°51.0'N	67°24.7'W	✓	✓	✓	1.6	65	81	85
14	12/5	1000	40°52.0'N	67°24.5'W	✓	✓	✓	1.6	62	83	86
15		1030	40°46.3'N	67°24.0'W	✓	✓					95
16		1055	40°40.3'N	67°24.5'W	✓	✓	✓	1.6	74	96	97
17		1140	40°36.2'N	67°23.0'W	✓	✓					104
18		1202	40°30.6'N	67°23.0'W	✓	✓	✓	1.6	40	154	164
19		1301	40°25.2'N	67°22.1'W	✓	✓					265
20		1357	40°32.7'N	67°34.2'W	✓	✓					128
21		1427	40°35.3'N	67°42.5'W	✓	✓	✓	1.6	62	93	94
22		1605	40°40.5'N	68°00.8'W	✓	✓	✓	1.6	50	83	85
23		1746	40°36.8'N	68°23.2'W	✓	✓	✓	1.6	50	75	90
24		1913	40°31.8'N	68°34.5'W	✓	✓					78
25		1956	40°26.9'N	68°46.0'W	✓	✓	✓	1.6	65	76*	79
26		2230	40°23.5'N	69°03.9'W	✓	✓					85
27		2349	40°21.1'N	69°11.6'W	✓	✓	✓	1.6	60	78*	85

Sta.	Date	Time	Latitude	Longitude	XBT	Surf	NT	Suspended Sample Depth (m)			Water Depth (m)
28	12/6	0130	40°15.5'N	69°38.1'W	✓	✓	✓	1.6	60	74*	77
29		0305	40°28.6'N	69°49.9'W	✓	✓	✓	1.6	55	65*	72
30		0445	40°36.5'N	69°56.4'W	✓	✓					59
31		0515	40°42.9'N	70°00.9'W	✓	✓	✓	1.6	39*		42
32		0630	40°35.8'N	70°05.2'W	✓	✓					55
33		0710	40°28.1'N	70"10.4'W	✓	✓					72
34		0735	40°22.5'N	70°14.0'W	✓	✓	✓	1.6	66	78*	81
35		0910	40°26.0'N	70°34.0'W	✓	✓					80
36		1009	40°28.5'N	70°51.6'W	✓	✓	✓	1.6	76(2)*		79
37		1135	40°25.1'N	71°09.5'W	✓	✓					85
38		1244	40°21.3'N	71°31.6'W	✓	✓	✓	1.6	60	76*	81
39		1430	40°10.7'N	71°48.7'W	✓	✓					82
40		1520	40°03.6'N	72°00.5'W	✓	✓	✓	1.6	61	80*	82
41		1655	39°54.8'N	72°14.8'W	✓	✓					88
42		1808	39°43.5'N	72°31.2'W	✓	✓	✓	1.6	40	78*	79
43		1915	39°38.5'N	72°35.8'W	✓	✓					79
44		1942	39°33.5'N	72°39.6'W	✓	✓					78
45		2008	39°28.1'N	72°43.4'W	✓	✓					76
46		2038	39°22.5'N	72°47.3'W	✓	✓	✓	1.6	62	76*	79
47		2210	39°14.0'N	72°56.5'W	✓	✓					72
48		2255	39°05.2'N	73°05.0'W	✓	✓					75
49		2345	38°57.0'N	73°12.0'W	✓	✓	✓	1.6	40	72*	75
50	12/7	0125	38°46.7'N	73°20.7'W	✓	✓					77
51		0900	38°34.3'N	73°30.1'W	✓		✓	1.6	40	70*	80
52		0935	38°39.2'N	73°33.5'W	✓						64
53		1006	38°44.2'N	73°33.6'W	✓						67
54		1030	38°48.4'N	73°35.8'W	✓						53

Sta.	Date	Time	Latitude	Longitude	XBT	Surf	NT	Suspended Sample Depth (m)			Water Depth (m)
55	12/7	1106	38°53.5'N	73°37.2'W	✓						48
56		1550	38°52.5'N	73°33.5'W	✓						58
57		1630	38°54.8'N	73°34.0'W	✓						52
58		1645	38°56.0'N	73°35.0'W	✓						47
59		1810	38°50.0'N	73°33.6'W	✓						58
60		1850	38°46.2'N	73°33.2'W	✓						68
61		1940	38°41.8'N	73°33.5'W	✓						67
62		2027	38°36.3'N	73°32.2'W	✓						75
63		2108	38°32.5'N	73°31.8'W	✓						80
64	12/8	1130	38°31.8'N	73°31.2'W	✓						79
65		1231	38°35.4'N	73°32.0'W	✓						72
66		1310	38°38.4'N	73°33.5'W	✓						72
67		1355	38°41.2'N	73°35.0'W	✓						64
68		1457	38°46.0'N	73°36.0'W	✓						54
69		1545	38°52.8'N	73°37.5'W	✓						46
70	12/9	0830	39°34.5'N	73°36.8'W	✓	✓					39
71		0928	39°30.8'N	73°18.5'W	✓	✓					41
72		1005	39°28.2'N	73°08.5'W	✓	✓					54
73		1045	39°27.0'N	73°00.0'W	✓	✓					70
74		1520	39°27.0'N	73°00.0'W	✓	✓	✓	1.6	50*	62*	68
75		1745	39°27.4'N	72°51.5'W	✓	✓					70
76		1950	39°51.2'N	72°31.0'W	✓	✓	✓	1.6	45	64*	68
77		2110	40°00.9'N	72°19.9'W	✓	✓					80
78		2220	40°13.0'N	72°07.2'W	✓	✓	✓	1.6	50	62*	69

Sta.	Date	Time	Latitude	Longitude	XBT	Surf	NT	Suspended Sample Depth (m)			Water Depth (m)
79	12/10	0000	40°26.9'N	71°52.6'W	✓	✓					70
80		0050	40°35.5'N	71°44.2'W	✓	✓	✓	1.6	50	61*	64
81		0205	40°46.0'N	71°27.7'W	✓	✓					66
82		0300	40°53.2'N	71°23.6'W	✓	✓					59
83		0330	40°56.3'N	71°19.4'W	✓	✓	✓		53*		56

Note:

*Salinity samples were also taken at these depths.